# Three new species of triggerplant (*Stylidium:* Stylidiaceae) from south-west Western Australia

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## Abstract

Lowrie, A. and Kenneally, K.F. Three new species of triggerplant (*Stylidium:* Stylidiaceae) from south-west Western Australia. Nuytsia 12(1): 75-82 (1998). Three new *Stylidium* species (*Stylidiaceae*) from south-western Australia, *S. daphne, S. ireneae* and *S. paulineae* Lowrie & Kenneally, are described and illustrated. The location for the holotype sheet of *Stylidium coatesianum* Lowrie & Carlquist is corrected.

## Introduction

Three new species of triggerplant (*Stylidium:* Stylidiaceae) of subg. *Tolypangium* Endl. are described and illustrated. *S. daphne* and *S. ireneae* belong to sect. *Saxifragoidea* Mildbr. which comprises 25 species characterized by having rosetted linear to obovate-spathulate leaves and simple racemose inflorescences (see Mildbraed 1908). *S. paulineae* belongs to sect. *Squamosae* Benth. which comprises 14 species characterized by having graminiform, linear, lanceolate or oblanceolate-linear leaves intermixed with shorter scarious scales. The three new species, are endemic to south-west Western Australia and all have conservation priority. Their designated names honour three women, who each in their own way have supported or advanced botanical pursuits throughout the state.

An omission that occurred with respect to the location of the holotype sheet in the original description of *Stylidium coatesianum* Lowrie & Carlquist is corrected.

## Taxonomy

**Stylidium coatesianum** Lowrie & Carlquist (Lowrie & Carlquist 1991: 8-11, Fig. 3). *Type:* In laterite soil on top of mesa east of the old homestead in the Tutanning Reserve east of Pingelly, Western Australia, 7 November 1989, *Allen Lowrie* 242 (*holo:* PERTH; *iso:* RSA).

*Notes.* Because of a typographical error in the original description of *Stylidium coatesianum*, the notation "(PERTH)" for the holotype location, was deleted. To correct this omission the corrected type citation is given in full above.

**Stylidium daphne** Lowrie & Kenneally, *sp. nov.*

*Stylidio coatesiano* Lowrie & Carlquist affinis sed bracteis secus pedunculum subulatis, ad basim gibbosis, sparse glandulosis, pilis glandularibus ad margine fimbriatis, bracteis floralibus similaribus sed marginem tantum pilis fimbriatis glandularibus instructis; labello cum appendicibus basalibus et 8 appendicibus faucis ornatis, flavo, clavato, papilloso differt.

*Typus*: Turn off to Cheynes Beach, off Hassell Highway, 19 km north west of beach, Western Australia, 34° 49' S, 118° 16' E, 20 December 1993, *K.F. Kenneally* 11424 (*holo:* PERTH 03061043; *iso:* MEL, NSW).

Erect perennial *herb* 25-35 cm high (including inflorescence); stem 3.5-5 cm long, with rosette nodes bearing 2 prop roots (the product of the basal portions of a previous seasons' leafy rosette growth) positioned along the stem, stolons 4-7 mm long, glabrous, basal portions of old peduncles often present on the upper rosette nodes. *Leaves* linear, shortly spurred at the base, acute at the apex (leaf tips often bent inwards on a small number of leaves within a terminal rosette), 1-3 cm long, 1-1.3 mm wide, slightly U-curved in section, 0.2-0.3 mm thick, densely covered with translucent-white, non-glandular hairs. *Inflorescence* racemose, 22-28 cm long (including peduncle), glabrous. *Bracts* along the peduncle subulate, gibbose at the base, 2.5-4 mm long, sparsely glandular, with glandular hairs fimbriate along the margins; floral bracts similar but bearing only fimbriate glandular hairs along the margins, 1.5-2.5 mm long; bracteoles opposite, subulate, 0.5-0.7 mm long, glabrous. *Pedicels* 3-7 mm long, mostly glandular-hairy between the bracteoles and hypanthium. *Hypanthium* obovoid, 1.7-2 mm long, 1-1.4 mm diam. at anthesis, glabrous. *Sepals* 5, all free to the base, lanceolate, 1.4-1.7 mm long, glabrous. *Corolla* adaxial surface dark yellow, abaxial surface of all lobes yellow with large central dark maroon-spotted red wine-coloured marks, lobes laterally paired, glabrous; anterior lobes oblong, 2.8-4 mm long, 1-1.8 mm wide, margins near labellum bearing *c.* 6 glandular hairs; posterior lobes oblong, 2.5-4 mm long, 1-2 mm wide. *Throat* appendages 8, yellow, clavate, papillose, shortest pair *c.* 0.6, longest pair *c.* 0.8 mm long. *Labellum* twisted to one side and appressed to 1 sepal; boss elliptic, *c.* 0.6 mm long, *c.* 0.4 mm wide, positioned below the base of the corolla tube sinus, attached by a short bridge, apical point *c.* 0.6 mm long; basal appendages *c.* 0.2 mm long. *Gynostemium* 4.5-6.7 mm long; anthers maroon, pollen pale yellow; stigma orbicular, cushioned-shaped, *c.* 0.5 mm diam. *Capsule* obovoid, 4-4.5 mm long, 1.7-2 mm diam. Seeds brown, ellipsoid, ruminate, 0.5-0.6 mm long, 0.2-0.25 diam. (Figure 1)

*Distribution.* Known only from the type location and observed but not collected at two locations (4.7 km and *c.* 20 km ) to the north east.

*Habitat.* Grows in damp sand amongst low heath at the type location; in sandy pockets of soil on the summit of a predominantly laterite hill amongst heath and scrub land with *Stylidium imbricatum* Benth. at a second location; and in sandy soil amongst low heath at a third location.

*Stylidium daphne* is a well camouflaged and a difficult species to locate in the field when it is not in flower. The leafy rosettes are mostly closely intermingled with other scrub and heathland species where they are well hidden from view.

*Flowering period.* December-January.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority Two.

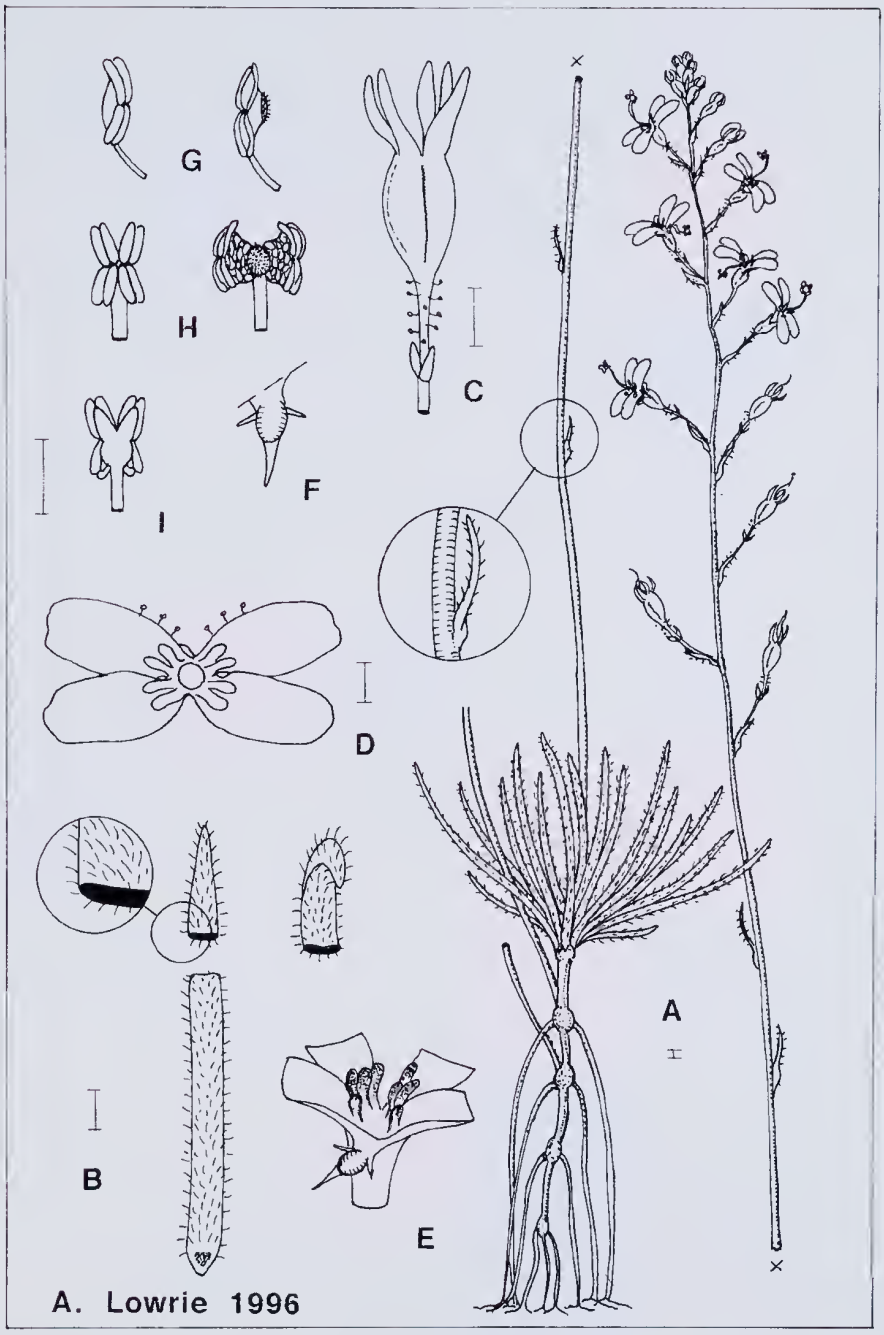


Figure 1. *Stylidium daphne* A - habit of flowering plant with enlarged view of peduncle bract left; B - leaf with enlarged portion and inward bent leaf tip right; C - hypanthium; D - corolla; E - lateral view of throat appendages and labellum; F - labellum; G - lateral view of gynostemium tip (with stigma at right); H - front view of gynostemium tip (with stigma grown out, right); I - back of gynostemium tip. Scale bar = 1 mm. Drawn from *K.F. Kenneally* 11424.

*Affinities.* The nearest relative to *Stylidium daphne* is *S. coatesianum* Lowrie & Carlquist. Both species have leaves densely covered with translucent-white non-glandular hairs and yellow flowers. *S. daphne* differs from *S. coatesianum* (whose contrasting characters are given in parentheses) by having bracts along the peduncle subulate, gibbose at the base, sparsely glandular, with glandular hairs fimbriate along the margins, floral bracts similar but bearing only fimbriate glandular hairs along the margins (lower peduncle bracts when present covered with translucent-white non-glandular hairs, upper peduncle bracts and floral bracts glabrous); labellum with basal appendages (labellum without basal appendages); and throat appendages 8, yellow, clavate, papillose (throat appendages 4, laciniate, with brown tips, alternating with 3 additional rounded and shining appendages).

*Etymology.* The specific epithet *Stylidium daphne* is named in honour of Daphne Joan Choules Edinger, botanist, entomologist, biology teacher and honorary CALM scientist. In this latter volunteer capacity she has assisted Kevin Kenneally for over fourteen years with research projects.

**Stylidium ireneae** Lowrie & Kenneally, *sp. nov.*

*Stylidido rupestri* Sond. affinis sed foliis sparsissime pilosis cum pilis non-glandulosis vel fere glabris, caulibus innovationum longitudinaliter porcatis, floribus pallido roseis differt.

*Typus*: Icy Creek, north of Dawn Creek Rd, east north east of Waroona, Western Australia [precise locality withheld], 29 October 1994, *A. Lowrie* 1068 (*holo:* PERTH 04675479; *iso:* MEL).

Erect perennial *herb* 10-30 cm high (mostly *c.* 18 cm high) including inflorescence, forming a small compact bush up to 15 cm in diam., rosette nodes situated on the soil surface or shortly prop-rooted, connected by leafless stolons 4-5 cm long, 1-4 or more new shoots arising from each rosette node, 3-5 cm long; stems maroon-coloured, 3-4 cm long, longitudinally ridged, sparsely glandular-hairy, with a few caducous leaves and a terminal rosette of crowded leaves. *Leaves* oblanceolate-spathulate, 12-20 mm long, 0.6-0.8 mm wide at the base, 3-5 mm wide near the apex, lunate in section, *c.* 0.2 mm thick, minutely mucronate at apex, very sparsely hairy or almost glabrous; hairs translucent-white non-glandular. *Inflorescence* racemose, usually 6-10 cm long (including peduncle), sparsely glandular-hairy. *Bracts* subulate, 2-3 mm long, glabrous; bracteoles similar, opposite, 0.6-1 long. *Pedicels* 5-8 mm long, glandular-hairy. *Hypanthium* oblong, 1.8-3 mm long, 0.7-1.3 mm diam. at anthesis, usually glabrous but sometimes with a few glands at the base. *Sepals* 5, all free to the base, subulate, 1.7-2.3 mm long, glabrous. *Corolla* adaxial surface pale pink, abaxial surface whitish pink, glabrous, lobes laterally paired; anterior lobes obovate-elliptic, 3.5-6.5 mm long, 1.6-3 mm wide; posterior lobes elliptic, 4.5-6 mm long, 1.5-2.5 mm wide. *Throat* silvery white, surrounded by reddish marks; appendages 8, triangular, silvery white, tips papillose. *Labellum* twisted to one side and appressed to 2 sepals but reaching only half way across the second sepal; boss elliptic, white with maroon around one margin, *c.* 0.8 mm long, *c.* 0.5 mm wide, positioned at the base of the corolla tube sinus, apical point white and *c.* 0.8 mm long; basal appendage 1, minute, maroon. *Gynostemium* 6.5-8 mm long; anthers blackish maroon, pollen greyish purple; stigma conical, capitate, *c.* 0.4 mm long, *c.* 0.4 mm diam. *Capsule* obovoid, 3-4 mm long, 1-1.5 mm diam. *Seeds* blackish brown, broadly ellipsoid, smooth, 0.4-0.5 mm long, 0.3-0.35 diam. (Figure 2)

*Distribution and habitat.* Known only from the type location. Grows in sandy loam on watershed of creek line.

*Flowering period.* October-November.

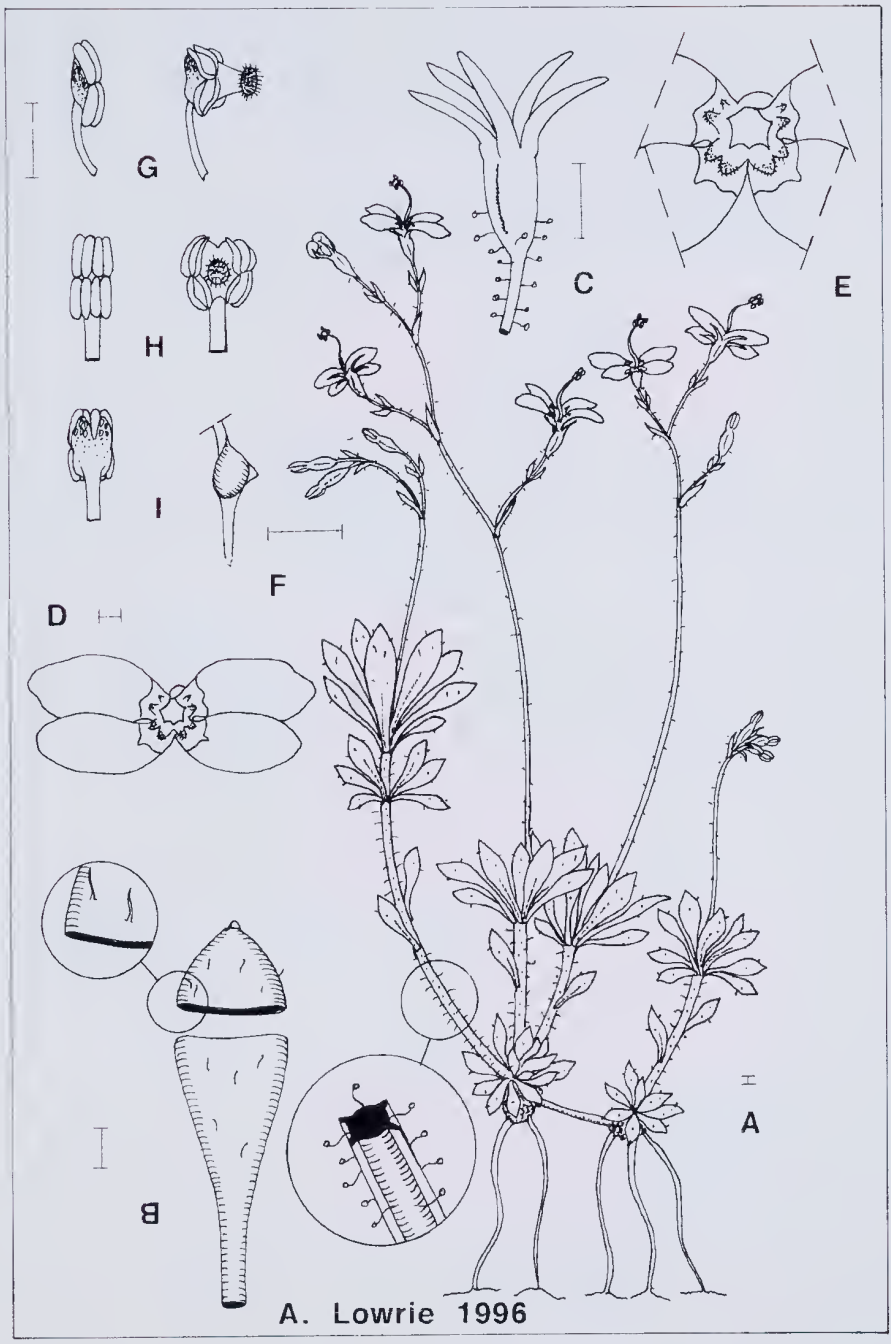


Figure 2. *Stylidium ireneae* A - habit of flowering plant with enlarged view of longitudinally ridged stem section; B - leaf with enlarged portion; C - hypanthium; D - corolla; E - throat appendages, enlarged; F - labellum; G - lateral view of gynostemium tip (with stigma at right) ; H - front view of gynostemium tip (with stigma grown out, right); I - back of gynostemium tip. Scale bar = 1 mm. Drawn from *A. Lowrie* 1068.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority One.

*Affinities.* The nearest relative to *Stylidium ireneae* is *S. rupestre* Sond. *S. ireneae* differs from *S. rupestre* (whose contrasting characters are given in parentheses) by having leaves glabrous or with a few non-glandular hairs (leaves glandular-hairy); stems longitudinally ridged (stems not longitudinally ridged); and flowers pale pink (flowers cream to pale yellow).

*Etymology.* The specific epithet *Stylidium ireneae* is named in honour of Irene Ioannakis, wife of Kevin Kenneally, in recognition of her support and companionship over many years of botanical endeavour. It is also an acknowledgement of her personal contribution to education and training in Western Australia.

**Stylidium paulineae** Lowrie & Kenneally, *sp. nov.*

*Stylidio schoenoides* DC. affinis sed foliis linearibus ad 2.5-4 cm longis, 0.6-1 mm latis, folii in eadem caespitem glabris, mucronatis, corolla pallido rosea 11-18 mm longa, et gynostemii 4.8-6 mm longa differt.

*Typus*: Bowelling-Duranilin road, 2 km from junction of Roelands-Lake King highway, south west of Darkin, Western Australia, 33° 27' S, 116° 30' E, 31 October 1994, *A. Lowrie* 1078 (*holo:* PERTH 04675487; *iso:* MEL).

Perennial scale-leaved *herb* forming a crowded leafy tuft on prop-roots 1.5-2 cm above the soil surface. *Scale leaves* subulate, 10-12 mm long, 1-1.3 mm wide, of a papery texture with a thickened midrib. *Leaves* linear, 2.5-4 cm long, 0.6-1 mm wide, depressed ovate in section with the addition of 2 fine shallow longitudinal grooves on the adaxial surface and 2 deeper longitudinal grooves bearing smooth epidermis cells in the valleys on the abaxial surface, 0.3-0.5 mm thick, indumentum of two types both within the same leafy tuft, the older winter leaves (generally few in number) scabrid on the adaxial surface and margins, abaxial surface glabrous, other than a few transitional leaves still bearing a few scabrid projections all other leaves within the leafy tuft glabrous at anthesis, apical mucro sharp 0.3-0.5 mm long. *Inflorescence* simple, corymbose, 5-10 cm long (including peduncle), glandular-hairy, peduncle pilose as well as glandular-hairy. *Bracts* 2.5-5 mm long, glandular-hairy; bracteoles alternate, 2-3 mm long glandular-hairy. *Pedicels* 3-18 mm long. *Hypanthium* ellipsoid, 2.5-4 mm long, 1.5-2.5 mm diam. at anthesis, densely glandular-hairy. *Sepals* 5, all free to the base, oblanceolate, 3 sepals 4-4.5 mm long, 2 sepals 3-3.5 mm long, densely glandular-hairy. *Corolla* adaxial surface pale pink, often with dark pink margins on the anterior lobes, abaxial surface whitish pink often with dark pink on the margins of anterior lobes, slightly glandular, lobes vertically paired; anterior lobes obovate-spathulate, 5-8 mm long, 3-5 mm wide, cruciate as well as bent backwards a little at the apex to form a forward-projected hood over the gynostemium, glandular-hairy on margins of the hood opening; posterior lobes elliptic, 6-10 mm long, 4.5-6 mm wide. *Throat* yellow surrounded by reddish marks; appendages 6, yellow, capitate, with silver hairs on the capitate apex. *Labellum* pale yellow, ovate, *c.* 2 mm long, *c.* 1 mm wide, with red-tipped glands on the margins; boss ovate, *c.* 0.7 mm long, *c.* 0.4 mm wide; basal appendages capitate, *c.* 0.3 mm long. *Gynostemium* 4.8-6 mm long; anthers yellow, vertically paired, pollen white; stigma elliptic, cushioned-shaped, *c.* 0.9 mm long, *c.* 0.4 mm wide. *Capsule* spherical, 8-10 mm long. *Seeds* rust-coloured, elliptic, alveolate, 2-2.5 mm long, 1.2-1.6 mm wide, transverse-linear in section, 0.3-0.4 mm thick. (Figure 3)

*Other specimens examined.* WESTERN AUSTRALIA: Lupton Wandoo Conservation Park, 32 km W of Brookton, 32° 26' 59" S, 116° 39' 25" E, 17 Sep. 1997, *R. Davis* 4151B (PERTH); State forest NE of intersection of Yarra Road and Brookton Highway, 32° 14' S, 116° 27' E, 2 Oct. 1995, *M. Hislop* 206 (PERTH).

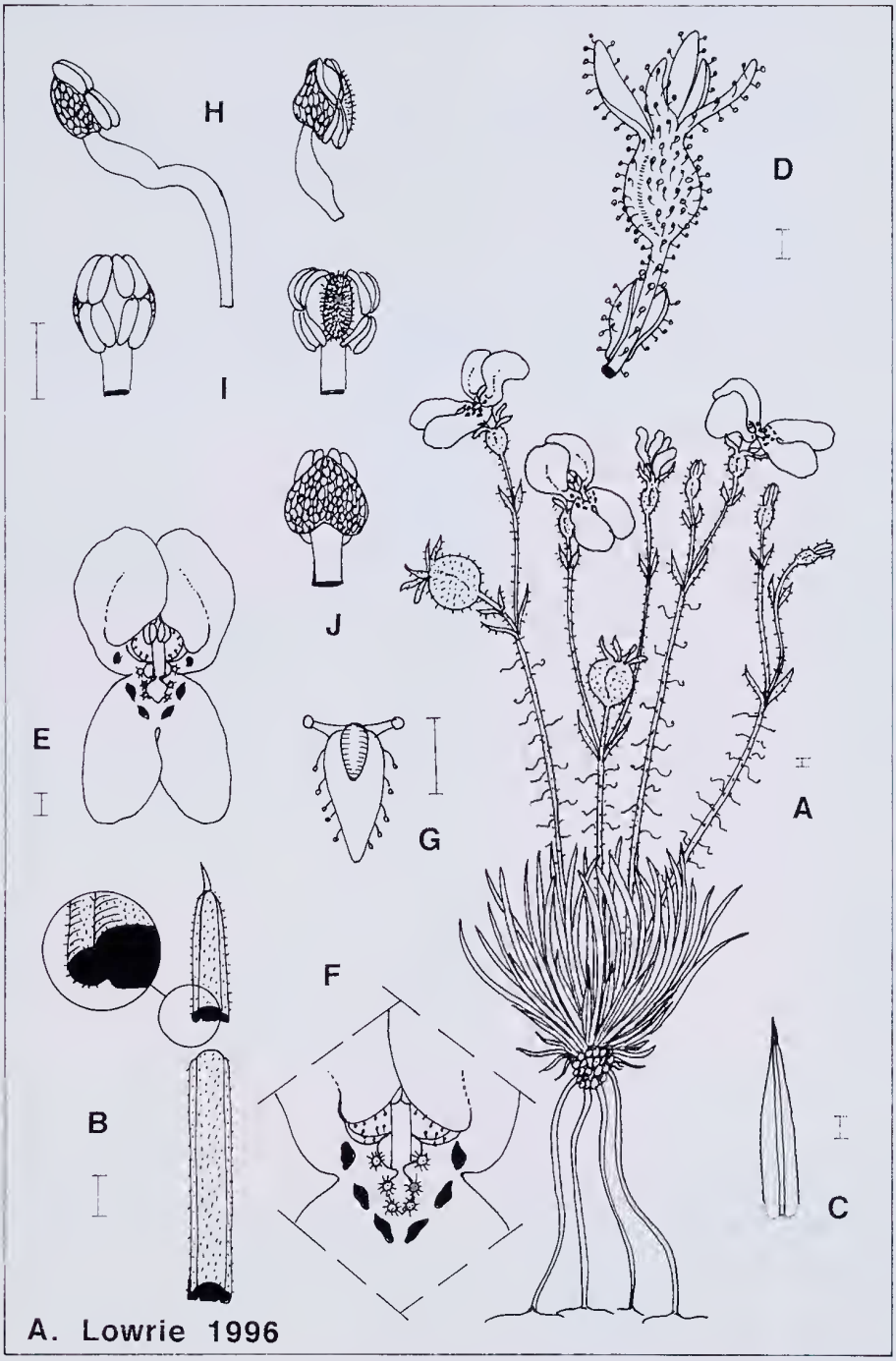


Figure 3. *Stylidium paulineae* A - habit of flowering plant; B - leaf bearing scabrid indumentum with enlarged portion; C - scale-leaf; D - hypanthium; E - corolla; F - throat appendages, enlarged; G - labellum; H - lateral view of gynostemium tip and column (with stigma at right); I - front view of gynostemium tip (with stigma grown out, right); J - back of gynostemium tip. Scale bar = 1 mm. Drawn from *A. Lowrie* 1078.

*Distribution and habitat.* Known only from the type locality and two additional localities 130 km to the north in State Forest west of Brookton. Grows in lateritic gravel and loam over sheet laterite in open wandoo and jarrah woodland.

*Flowering period.* September-November.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority Two.

*Affinities.* The nearest relative to *Stylidium paulineae* is *S. schoenoides* DC. (whose contrasting characters are given in parentheses) from which it differs by having leaves 2.5-4 cm long (leaves 15-40 cm long); leaf indumentum of two types both scabrid and glabrous within the same leafy tuft (all leaves glabrous); leaves bearing a sharp apical mucro (apical mucro absent); corolla pale pink, 11-18 mm long (corolla white, 30-40 mm long); and gynostemium 4.8-6 mm long (gynostemium 13-19 mm long).

*Etymology. Stylidium paulineae* is named in honour of Pauline Lowrie, wife, companion and research assistant to Allen Lowrie.

*Notes. Stylidium paulineae* is a remarkable species within the genus. The very short gynostemium is housed within the hood-like arrangement of the anterior petals in both the set and triggered positions. Pollinators are attracted and directed by throat appendages and colour markings into the hood, where pollen is deposited on or retrieved from the upper parts of the pollinator's body by the action of the gynostemium.

*Stylidium paulineae* has been discovered growing with *S. schoenoides* (*A. Lowrie* 1080 PERTH) at the type location. Both species were flowering at the time of collection and no hybrids or intermediate forms of either species were found.

**Acknowledgements**

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**References**

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